REMARKS

Claims 1-20 are pending in this application. Claims 1-20 have been rejected.

Approval and entry of this amendment are respectfully requested.

Claims 15-20 have been rejected under 35 U.S.C. §112 first paragraph for lack of adequate written disclosure. Specifically, the Office has posted the question that "it is unclear how the bearings 18 and/or 19 are axially displaceable relative to sleeve 17 if the bearings are restrained axially on one side by surface 14b and on the other side by cover plate 50.

It is well known to people of ordinary skill in the art that the displacement caused by thermal expansion and contraction is so minute that engineering drawings virtually never illustrate any such displacement. Therefore, even though the bearings are restrained axially on one side by surface 14b and on the other side by cover plate 50, the minute displacement still exist as rotational friction induces thermal expansion and contraction. Reconsideration and withdraw of the 112, first paragraph rejection are respectfully requested.

Claims 1-20 have been rejected under 35 U.S.C. §112 second paragraph for containing vague and indefinite claim language. The claim language has been amended, as needed, to correct any obvious errors.

Claims 1, 4-6 and 8-10 have been rejected under 35 U.S.C. §102(b) as being anticipated by Nenninger (U.S. Patent No. 1,761,841). This rejection is traversed for reasons stated hereinbelow.

In this Office action, the Office has stated that:

"Nenninger teaches a machine tool spindle 29 (page 1, line 86) that is fixed on one end and allowed to move axially with respect to the rotational axis of the spindle on the other end as the spindle expands and contracts due to variances in temperature (page 2, lines 22-37 and 128-130). The spindle is mounted in a column or housing C (see Figure 1), and is supported with roller bearings 74 (Figure 5) and 25, 26 (Figure 4) on opposite ends of the spindle, where the bearings are positioned within enlarged seats of the housing (Figures 2, 4, and 5). The bearings have inner and outer races (Figures 4 and 5). Bearing 74 is mounted on the rear of the spindle (page 1, line 62), and floats or axially moves within sleeve 70 (page 2, lines 110-130). Rigid annular sleeve 70 is disposed between bearing 74 and the housing (Figure 5) and is fixed with respect to (or "bonded to") the housing via stud screw 72 (Figure 5 and page 2, lines 114-116). The spindle 29 has a nose 30 that is adapted to engage a cutter arbor or "tool holder" (page 1, column 85-87)."

It is respectfully submitted that most of the citations and the drawings referred to in this rejection are associated with roller bearings of Figures 1, 2, 3 and 4 of Nenninger, wherein the bearings 49 are of a cylindrical cone shape with various diameters. This is distinctly different from the ball bearing as shown in Figures 1-4 of the present invention. Due to the difference in bearings, the dynamics associated with rolling motions are distinctly different, thus, elements making the rolling motions possible are very different and ways to ensure alignment between the spindle and bearings are very different. Therefore, Nenninger fails to disclose or teach each and every element of the claimed invention so as to anticipate the claimed invention.

Irrespective to the merit of this rejection, the subject matter of claim 2 is incorporated into independent claim 1. Amended independent claim 1 further includes a feature that the sleeve is bonded to the housing with a metal-to-metal adhesive bonding material. This feature is neither disclosed, taught nor suggested in Nenninger.

Since Nenninger fails to disclose, teach or suggest a metal-to-metal adhesive bonding material, independent claim 1, as amended, patentably distinguish over Nenninger; all

claims dependent thereon, also patentably distinguish over Nenninger.

Claims 2-3 7 and 11-14 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Nenninger (U.S. Patent No. 1,761,841) as applied to claims 1 and 6 above. This rejection is traversed for reasons stated hereinbelow.

In this Office action, the Office has positively stated that:

> "Nenninger discloses all of the limitations of claims 2, 3, 7, and 11-14 as set forth in the above 102(b) rejection."

This statement is incorrect, because Nenninger fails to disclose, teach or suggest any sleeve that is bonded to the housing with a metal-to-metal adhesive bonding material.

The Office has further stated that:

> "as shown in Figure 5, it appears that the bearing seat is slightly oversized with respect to the sleeve 70. Nenninger also specifically teaches that the bearing cone 27 is press fit onto the spindle, and states that the other bearing 74 "floats with the end of the spindle" (page 2, lines 128-129), implying that the bearing 74 is also press fit onto the spindle.

Again, the Office is referring to roller bearings having a cylindrical cone shape with various diameters. The bearing cone 27 as cited in the rejection and shown in

Figure 4 illustrates a configuration only suitable to a roller bearing, not suitable to a ball bearing. Therefore, the dynamics involved and elements associated therewith are completely different from that of the claimed invention.

The Office has also stated that:

> Nenninger does not specifically teach that the oversize of the bearing seat is in the range of 0.010 to 0.015 inches. Nenninger also does not teach the use of an epoxy resin adhesive to bond the sleeve 70 to the housing, but instead teaches the stud screw 72 to perform the same function. However Official Notice is taken that the use of "epoxy resin adhesive" to bond metal to metal and to let this "epoxy resin adhesive" set or dry was notoriously well known in the art at the time the invention was made. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have applied epoxy resin adhesive to one or both of the outer surface of the fixed sleeve 70 taught by Nenninger, or the inner surface of the housing taught by Nenninger, to fix the sleeve with respect to the housing, and to let this adhesive dry or set. With respect to the oversize of the bearing seat, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have made the oversize whatever size was desired, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233."

Regarding the notion that stud screw 72 and an adhesive serve the same function, the Applicant respectfully disagree. As shown in Figure 5, contacting surfaces of sleeve 70 and the housing held together by stud screw 72 must be perfectly even in order to ensure proper alignment

of spindle 29 and ball bearing unit 74. Should the surfaces been uneven, then ball bearing unit 74 would have been out of alignment with spindle 29 if the stud screw 72 is used. Moreover, the tighter is the stud screw 72, the greater is the alignment problem attributed by the unevenness. Therefore, in using the stud screw 72 arrangement, contacting surfaces of the sleeve 70 and the housing must be machined to precise specification, which incurs substantial cost.

In addition, by using stud screws, precision drilling must be performed to ensure proper alignment of threads in the housing and sleeve 70 when stud screw 72 is threaded therein.

To use the stud screw arrangement, such factors as whether a sleeve provides sufficient thickness to accommodate a stud screw and whether the housing is suitable to accommodate a stud screw must be considered. Furthermore, the sleeve, the stud screw and the housing are typically made of different materials, thus different rates of thermal expansion and contraction will loosen the stud screw over time thus require periodic maintenance.

All of these shortcomings of a stud screw arrangement are eliminated by using an adhesive. Therefore, an adhesive is not an obvious substitute of a stud screw as purported by the Office. As the Office has taken official notice of the obvious substitute, the Applicant respectfully request presentation of any prior art reference supporting the official notice.

It is well-settled that:

> "[o]bviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion supporting the combination. Under section 103, teachings of references can be combined only if there is some suggestion or incentive to do so." ACE Hospital Systems, Inc. v. Montefiore Hospital et al., 221 USPQ 929, 933 (Fed. Cir. 1984).

It is also well settled that:

> "One cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention." In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988).

Indeed, the Office is using hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention. By regarding an adhesive to be an obvious substitute of a stud screw, the Office totally ignores alignment issues between a spindle and a bearing.

Besides, it is an indisputable fact that Nenninger neither disclosed nor provided any hint of using an adhesive. Yet, the claimed invention specifically teaches the use of an adhesive. Long and behold, the official reason of rejection is that an adhesive is an obvious substitute of a stud screw. In rendering this rejection, the Office, instead of presenting any teaching reference, merely and conveniently took official notice that the obvious substitute is correct. Based on the record as a whole, where is the teaching of an adhesive come from? The indisputable answer seems to be the Applicant's own specification, for the teaching certainly did not come from Nenninger and it would be absurd to say the teaching comes from the Official notice. Hence, hindsight!

It should further be noted that claims 11-14 discloses a method of fabricating a spindle assembly with specific steps clearly stipulated therein the claims. Nenninger totally fails to disclose these specific method steps. Therefore, these method claims patentably distinguish over Nenninger.

Claim 15 has been rejected under 35 U.S.C. §103(a) as being unpatentable over Nenninger (U.S. Patent No.

1,761,841) as applied to claims 1 above. This rejection is traversed for reasons stated hereinbelow.

The Office action has stated that:

> "Nenninger teaches all aspects of the invention as set forth in claim 15 as described in the above 102(b) rejection of claim 1 except for a second moveable bearing in a second fixed sleeve, and that the fixed sleeves are fixed with adhesive bonding material that is allowed to dry or set. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have added another fixed sleeve and moveable bearing to the device taught by Nenninger, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. St. *Regis Paper Co. v. Bemis Co.*, 193 USPQ 8. With respect to the adhesive bonding material, Official Notice' is taken that the use of "adhesive bonding material" to bond metal to metal, and to let this "adhesive bonding material" set or dry was notoriously well known in the art at the time the invention was made. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have applied adhesive bonding material to one or both of the outer surface of the fixed sleeve 70 taught by Nenninger, or the inner surface of the housing taught by Nenninger, to fix the sleeve with respect to the housing, and to let the adhesive bonding material dry or set."

Regarding the issue whether it is obvious to substitute an adhesive for a stud screw, the Applicant's responses made to the previous rejections equally applies herein, thus they are redundantly repeated.

Regarding the Office characterization that the claimed invention is substantially the same as Nenninger deviating

therefrom by the addition of a second moveable bearing, the Applicant disagrees.

This is a gross triviality of major differences between the claimed invention and Nenninger. In fact, Nenninger merely described its embodiment and inter-relationships among various elements, but it has not disclose or teach a method with steps to fabricate. Independent 15 is a method claim clearly stipulating steps involved to fabricate a spindle assembly. These steps are neither disclosed nor taught by Nenninger. Therefore, claims 15 patentably distinguish over Nenninger.

Should the Office disagrees with the Applicant's position, the Applicant respectfully requests the Office to provide citations in Nenninger of the claimed method steps of claim 15 as duplicated herein for the analysis benefit of the Examiner. For each step that cannot be found in Nenninger, please provide basis as to how it is deemed obvious.

15. A method according to Claim 11 including;

forming first and second bearing seats in said housing

( );

mounting said spindle on a race of a first bearing having inner and outer races ( );

mounting a first sleeve on the other of said races of said first bearing so that said first bearing is axially displaceable relative to said sleeve ( );

applying an adhesive bonding material to at least one surface of said sleeve and a surface of said first bearing seat ( );

mounting said spindle with said first bearing and first sleeve, on said housing so that said first sleeve surface is disposed adjacent said first bearing seat surface with said adhesive bonding material adjoining said surfaces ( );

mounting a second sleeve on a race of said second bearing so that said second bearing is axially displaceable relative to said second sleeve ( );

applying an adhesive bonding material on at least one of a surface of said second sleeve and a surface of said second bearing seat ( );

mounting the other race of said second bearing on said house so that said second sleeve surface is disposed adjacent said second bearing seat surface with said adhesive bonding material adjoining said second sleeve surface and said second bearing seat surface ( ); and

allowing said adhesive bonding materials to set to rigidly secure said sleeves to said housing ( ), permitting said bearings to displace along an axial line of travel relative to said spindle, relative to said sleeve ( ).

Claims 16-20 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Nenninger (U.S. Patent No. 1,761,841). This rejection is traversed for reasons stated hereinbelow.

The Office action has stated that:

"Nenninger teaches all aspects of the invention as claimed in claims f 6-20 as set forth above, and also teaches the use of a spacer sleeve 75 (page 2, line 120) that is between the bearings (Figures 4 and 5). Nenninger also teaches the use of nuts 77 (page 2, line 126, Figure 5) and 33 (page 1, line 92, Figure 4) to retain the bearings within the housing opening. Nenninger also teaches the use of a cover plate 76 (Figure 5) that engages a race of the first bearing. Nenninger does not teach a second moveable bearing in a second fixed sleeve, nor that the fixed sleeves are fixed with adhesive bonding material that is allowed to dry or set, nor does Nenninger teach that the cover plate engages the outer race of the first bearing. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have added another fixed sleeve and moveable bearing to the device taught by Nenninger, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. St. *Regis Paper Co. v. Bemis Co.*, 193 USPQ 8. With respect to the adhesive bonding material, Official Notice is taken that

the use of "adhesive bonding material" to bond metal to metal, and to let this "adhesive bonding material" set or dry was notoriously well known in the art at the time the invention was made. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have applied adhesive bonding material to one or both of the outer surface of the fixed sleeve 70 taught by Nenninger, or the inner surface of the housing taught by Nenninger, to fix the sleeve with respect to the housing, and to let the adhesive bonding material dry or set. With respect to the cover plate engaging the outer race, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have rearranged the cover plate taught by Nenninger such that it engages the outer race of the bearing, since it has been held that rearranging parts of an invention involves only routine skill in the art. *In re Japikse*, 86 USPQ 70.

Again, claims 16-20 clearly recite method steps to fabricate a spindle assembly. Nenninger merely recites the arrangement of its embodiment and inter-relationships among various elements therein. It fails to disclose or teach any method steps to fabricate.

The Office has attempted to describe its perception of similar and different embodiment arrangements between Nenninger and the claimed invention. However, the Office has not addressed whether and where does Nenninger disclose or teach method steps of the claimed invention.

Even though Nenninger and the claimed invention are not as similar as purported by the Office, it should be

noted that method steps cannot be evaluated by the basis of similarities between end products, because there are many methods to manufacture a product.

Therefore, claims 16-20 patentably distinguish over Nenninger.

The Office has provided a list of prior art references indicated to be pertinent to the disclosure of the present invention. The Undersigned has taken notice of the prior art references and has regarded them to be no more pertinent than the applied prior art references.

CONCLUSION

In accordance with the foregoing, it is respectfully submitted that the claimed invention patentably distinguish over the applied prior art of record. There being no other objections or rejections, allowance of the present application is respectfully requested.

Should a personal interview be needed to advance the prosecution of the present application, the Examiner is invited to contact the undersigned attorney.

The Commissioner is hereby authorized to charge any underpayment of fees or credit any overpayment of fees in connection with this communication to Deposit Account 12-0429.

Respectfully submitted,

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In compliance with MPEP 512, it is determined that this communication is neither:

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Michael Lau

Michael N. Lau